

## CLAIMS

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- 3 *Sub A2*
- 4 1. A method including
- 5 persistently maintaining at least one event message until at least one in-
- 6 tended recipient of said event message confirms delivery of said event message; and
- 7 upon recovery from an error, replaying said event message;
- 8 whereby said event message is reliably delivered to said intended recipient.
- 9 2. A method as in claim 1, including
- 10 receiving said event message by said intended recipient; and
- 11 generating a confirmation of said event message in response to said event
- 12 message.
- 13
- 14 3. A method as in claim 1, wherein said event message is provided by
- 15 at least one event message producer.
- 16
- 17 4. A method as in claim 1, wherein said persistent maintenance in-
- 18 cludes recording said event message in an event-indication queue, said event-indication
- 19 queue having resources pre-allocated before occurrence of an event associated with said
- 20 event message.
- 21

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5. A method as in claim 1, wherein said persistent maintenance includes recording said event message in an event-indication queue, wherein said event-indication queue is reliable even when the event message indicates that allocation of new resources is unstable.

6. A method as in claim 1, wherein said persistent maintenance includes recording said event message during a duration when delivery of said event message is not yet feasible.

7. A method as in claim 6, including upon termination of said duration, replaying said event message; whereby said event message is reliably delivered to said intended recipient.

8. A method as in claim 6, wherein said duration includes a boot time or an initialization time.

9. A method as in claim 1, wherein said persistent maintenance includes recording said event message in a persistent memory.

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10. A method as in claim 9, including delivering said event message to said intended recipient; receiving a confirmation of said delivery; and

PubA2

removing said event message from said persistent memory in response to  
said confirmation.

11. A method including

persistently maintaining at least one event message during a duration when

delivery of said event message is not yet feasible; and

upon termination of said duration, replaying said event message;

whereby said event message is reliably delivered to an intended recipient of  
said event message.

12. A method as in claim 11, wherein said duration includes a boot time  
or an initialization time.

13. A method as in claim 11, wherein said event message is provided by  
at least one event message producer.

14. A method as in claim 11, including persistently maintaining at least  
one event message until at least one intended recipient of said event message confirms  
delivery of said event message.

15. A method as in claim 14, including

upon recovery from an error, replaying said event message;

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whereby said event message is reliably delivered to said intended recipient.

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3 16. A method as in claim 14, wherein said persistent maintenance in-

4 cludes recording said event message in an event-indication queue, said event-indication

5 queue having resources pre-allocated before occurrence of an event associated with said

6 event message.

7

8 17. A method as in claim 14, wherein said persistent maintenance in-

9 cludes recording said event message in an event-indication queue, wherein said event-

10 indication queue is reliable even when the event message indicates that allocation of new

11 resources is unstable.

12

13 ~~18. A method as in claim 11, wherein said persistent maintenance in-~~

14 ~~cludes recording said event message in a persistent memory.~~

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16 *subA2*

17 19. A method as in claim 18, including

18 delivering said event message to said intended recipient;

19 receiving a confirmation of said delivery; and

20 removing said event message from said persistent memory in response to

21 said confirmation.

22 20. A method as in claim 11, including

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receiving said event message by said intended recipient; and

generating a confirmation of said event message in response to said event message.

21. A method including

maintaining at least one event message in a plurality of memory locations,

each one of said plurality of memory locations being accessible by both a first server device and a second server device; and

upon recovery from an error at said first server device, replaying said event message from said second server device;

whereby said event message is reliably delivered to an intended recipient of said event message.

22. A method as in claim 21, wherein said event message is provided by

at least one event message producer.

23. A method as in claim 21, wherein said maintenance includes persis-

tently maintaining said event message during a duration when delivery of said event message is not yet feasible.

24. A method as in claim 23, including

upon termination of said duration, replaying said event message;

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whereby said event message is reliably delivered to an intended recipient of  
said event message.

25. A method as in claim 23, wherein said duration includes a boot time  
or an initialization time.

26. A method as in claim 23, wherein said event message is provided by  
at least one event message producer.

27. A method as in claim 21, wherein said maintenance includes persis-  
tently maintaining said event message until at least one intended recipient of said event  
message confirms delivery thereof.

28. A method as in claim 27, wherein said persistent maintenance in-  
cludes recording said event message in an event-indication queue, said event-indication  
queue having resources pre-allocated before occurrence of an event associated with said  
event message.

29. A method as in claim 27, wherein said persistent maintenance in-  
cludes recording said event message in an event-indication queue, wherein said event-  
indication queue is reliable even when the event message indicates that allocation of new  
resources is unstable.

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2 30. A method as in claim 27, wherein said persistent maintenance in-  
3 cludes recording said event message in a persistent memory.  
4

5 31. A method as in claim 30, including  
6 delivering said event message to said intended recipient;  
7 receiving a confirmation of said delivery; and  
8 removing said event message from said persistent memory in response to  
9 said confirmation.  
10

11 32. A method as in claim 30, including  
12 receiving said event message by said intended recipient; and  
13 generating a confirmation of said event message in response to said event  
14 message.  
15

16 33. A method including  
17 delivering at least one event message to a multiplexing recipient;  
18 maintaining said event message at said multiplexing recipient; and  
19 reliably delivering said event message from said multiplexing recipient to at  
20 least one intended recipient of said event message.  
21

22 34. A method as in claim 33, including

pub A2

receiving said event message by said intended recipient; and  
generating a confirmation of said event message in response to said event  
message.

35. A method as in claim 33, wherein said event message is provided by  
at least one event message producer.

36. A method as in claim 33, wherein reliable delivery of said event  
message from said multiplexing recipient includes  
persistently maintaining said event message at said multiplexing recipient;  
upon recovery from an error at said multiplexing recipient, replaying said  
event message from said multiplexing recipient to said intended recipient;  
whereby said event message is reliably delivered to said intended recipient.

37. A method as in claim 36, wherein said persistent maintenance in-  
cludes recording said event message in an event-indication queue, said event-indication  
queue having resources pre-allocated before occurrence of an event associated with said  
event message.

38. A method as in claim 36, wherein said persistent maintenance in-  
cludes recording said event message in an event-indication queue, wherein said event-




1 indication queue is reliable even when the event message indicates that allocation of new  
 2 resources is unstable.

3  
 4 ~~39. A method as in claim 36, wherein said persistent maintenance in-~~  
 5 ~~cludes recording said event message in a persistent memory.~~

7 ~~40. A method as in claim 39, including~~  
 8 ~~delivering said event message to said intended recipient;~~  
 9 ~~receiving a confirmation of said delivery; and~~  
 10 ~~removing said event message from said persistent memory in response to~~  
 11 ~~said confirmation.~~

13 ~~41. A method as in claim 33, wherein reliable delivery of said event~~  
 14 ~~message from said multiplexing recipient includes~~  
 15 ~~persistently maintaining said event message at said multiplexing recipient~~  
 16 ~~until at least one intended recipient of said event message confirms delivery of said event~~  
 17 ~~message;~~  
 18 ~~sending a confirmation of delivery from said multiplexing recipient in re-~~  
 19 ~~sponse to a confirmation of delivery from said intended recipient.~~


21 ~~42. A method as in claim 41, wherein said persistent maintenance in-~~  
 22 ~~cludes recording said event message in an event-indication queue, said event-indication~~

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1 queue having resources pre-allocated before occurrence of an event associated with said  
2 event message.

3  
4 43. A method as in claim 41, wherein said persistent maintenance in-  
5 cludes recording said event message in an event-indication queue, wherein said event-  
6 indication queue is reliable even when the event message indicates that allocation of new  
7 resources is unstable.

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9 44. A method as in claim 36, wherein said persistent maintenance in-  
10 cludes recording said event message in a persistent memory.

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11  
12 45. A method as in claim 44, including  
13 delivering said event message to said intended recipient;  
14 receiving a confirmation of said delivery; and  
15 removing said event message from said persistent memory in response to  
16 said confirmation.

17  
18 46. A memory including instructions, said instructions capable of being  
19 interpreted to indicate  
20 persistently maintaining at least one event message until at least one in-  
21 tended recipient of said event message confirms delivery of said event message; and  
22 upon recovery from an error, replaying said event message;

Pub A2  
2 whereby said event message is reliably delivered to said intended recipient.

3 47. A memory as in claim 46, wherein said instructions are also capable  
4 of being interpreted to indicate recording said event message during a duration when de-  
5 livery of said event message is not yet feasible.

6  
7 48. A memory including instructions, said instructions capable of being  
8 interpreted to indicate

9 maintaining at least one event message in a plurality of memory locations,  
10 each one of said plurality of memory locations being accessible by both a first server de-  
11 vice and a second server device; and

12 upon recovery from an error at said first server device, replaying said event  
13 message from said second server device;

14 whereby said event message is reliably delivered to an intended recipient of  
15 said event message.

16  
17 49. A memory including instructions, said instructions capable of being  
18 interpreted to indicate

19 delivering at least one event message to a multiplexing recipient;

20 maintaining said event message at said multiplexing recipient; and

21 reliably delivering said event message from said multiplexing recipient to at  
22 least one intended recipient of said event message.

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 3 50. Apparatus including

4 means for persistently maintaining at least one event message until at least

5 one intended recipient of said event message confirms delivery of said event message;

6 and

7 means for replaying said event message upon recovery from an error.

8 51. Apparatus as in claim 50, including

9 means for receiving said event message by said intended recipient; and

10 means for generating a confirmation of said event message in response to  
 11 said event message.

12 52. Apparatus as in claim 50, wherein said means for persistently main-  
 13 taining includes means for recording said event message in an event-indication queue,

14 said event-indication queue having resources pre-allocated before occurrence of an event

15 associated with said event message.  
 16

17 53. Apparatus as in claim 50, wherein said means for persistently main-  
 18 taining includes means for recording said event message in an event-indication queue,

19 wherein said event-indication queue is reliable even when the event message indicates

20 that allocation of new resources is unstable.  
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54. Apparatus as in claim 50, wherein said means for persistently main-  
taining includes means for recording said event message during a duration when delivery  
of said event message is not yet feasible.

55. Apparatus as in claim 54, including  
upon termination of said duration, means for replaying said event message;  
whereby said event message is reliably delivered to said intended recipient.

56. Apparatus as in claim 54, wherein said duration includes a boot time  
or an initialization time.

57. Apparatus as in claim 50, wherein said means for persistently main-  
taining includes means for recording said event message in a persistent memory.

pubA2

58. Apparatus as in claim 57, including  
means for delivering said event message to said intended recipient;  
means for receiving a confirmation of said delivery; and  
means for removing said event message from said persistent memory in re-  
sponse to said confirmation.

59. Apparatus including

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1 means for persistently maintaining at least one event message during a du-  
2 ration when delivery of said event message is not yet feasible; and  
3 upon termination of said duration, means for replaying said event message.  
4


5 60. Apparatus as in claim 59, wherein said duration includes a boot time  
6 or an initialization time.  
7

8 61. Apparatus as in claim 59, including means for persistently main-  
9 taining at least one event message until at least one intended recipient of said event mes-  
10 sage confirms delivery of said event message.  
11


12 62. Apparatus as in claim 61, including, upon recovery from an error,  
13 means for replaying said event message.  
14

15 63. Apparatus as in claim 61, wherein said means for persistently main-  
16 taining includes means for recording said event message in an event-indication queue,  
17 said event-indication queue having resources pre-allocated before occurrence of an event  
18 associated with said event message.  
19

20 64. Apparatus as in claim 61, wherein said means for persistently main-  
21 taining includes means for recording said event message in an event-indication queue,

*pubA2*  wherein said event-indication queue is reliable even when the event message indicates that allocation of new resources is unstable.

65. Apparatus as in claim 59, wherein said means for persistently maintaining includes means for recording said event message in a persistent memory.

*pubA2*  66. Apparatus as in claim 65, including means for delivering said event message to said intended recipient; means for receiving a confirmation of said delivery; and means for removing said event message from said persistent memory in response to said confirmation.

67. Apparatus as in claim 65, including means for receiving said event message by said intended recipient; and means for generating a confirmation of said event message in response to said event message.

68. Apparatus including means for maintaining at least one event message in a plurality of memory locations, each one of said plurality of memory locations being accessible by both a first server device and a second server device; and

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upon recovery from an error at said first server device, means for replaying

2 said event message from said second server device.

3  
4 69. Apparatus including

5 means for delivering at least one event message to a multiplexing recipient;

6 means for maintaining said event message at said multiplexing recipient;

7 and

8 means for reliably delivering said event message from said multiplexing re-  
9 cipient to at least one intended recipient of said event message.

10  
11 70. Apparatus as in claim 69, including

12 means for receiving said event message by said intended recipient; and

13 means for generating a confirmation of said event message in response to  
14 said event message.

15  
16 71. In a method including reliable delivery of event messages, a memory

17 including

18 a persistent record of at least one event message until at least one intended  
19 recipient of said event message confirms delivery of said event message; and

20 upon recovery from an error, a replayable instance of said event message.



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72. A memory as in claim 71, including a record of said event message during a duration when delivery of said event message is not yet feasible.

73. A memory as in claim 71, including at least one event message in a plurality of memory locations, each one of said plurality of memory locations being accessible by both a first server device and a second server device; and

upon recovery from an error at said first server device, at least one instance of said event message replayable from said second server device.

74. In a method including reliable delivery of event messages, a memory including

a persistent record of at least one event message at a multiplexing recipient;

and

an instance of said event message deliverable from said multiplexing recipient to at least one intended recipient of said event message.

75. In apparatus having elements capable of performing a method, said method including reliable delivery of event messages, a memory including

a persistent record of at least one event message until at least one intended recipient of said event message confirms delivery of said event message; and

upon recovery from an error, a replayable instance of said event message.

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3 76. A memory as in claim 75, including a record of said event message  
4 during a duration when delivery of said event message is not yet feasible.

5 77. A memory as in claim 75, including  
6 at least one event message in a plurality of memory locations, each one of  
7 said plurality of memory locations being accessible by both a first server device and a  
8 second server device; and  
9 upon recovery from an error at said first server device, at least one instance  
10 of said event message replayable from said second server device.

11  
12 78. A memory as in claim 75, including  
13 a persistent record of at least one event message at a multiplexing recipient;  
14 and  
15 an instance of said event message deliverable from said multiplexing re-  
16 cipient to at least one intended recipient of said event message.